

## WILDLIFE MANAGEMENT UNIT 16 - CENTRAL MOUNTAINS

### SUBUNIT 16B - CENTRAL MOUNTAINS, MANTI NORTH

#### Subunit 16B Boundary Description

**Utah, Sanpete, Emery, and Carbon counties** - Boundary begins at the junction of SR-10 and SR-31 in Huntington; north on SR-10 to US-6; northwest on US-6 to US-89; south on US-89 to SR-31; southeast on SR-31 to Huntington.

#### Subunit Description

Management Subunit 16B covers both the east and west slopes of the Wasatch Plateau that lie within the above listed subunit boundaries. The western portion of this subunit was monitored in 2007, which includes the area from Soldier Summit west to US-89 and south to Fairview. The east side of this management subunit is monitored as part of the Southeastern Region rotation, last sampled in 2004, and will be sampled again in 2009. The range trend studies in this subunit were established in 1989 and all but two were sampled again in 1997, 2002, and 2007. The exceptions (Starvation Mahogany, 186B-8 and Starvation Mountain Brush, 16B-9) were re-sampled for the first time in 1999 and then again in 2002 and 2007. Studies were selected based on recommendations of local interagency personnel and some were placed on old 1978 line-intercept (LI) studies. The majority monitor winter ranges along US-89 from Spanish Fork Canyon to Fairview and on the southern side of US-6 in Spanish Fork Canyon. Two monitor transitional and summer ranges along Skyline Drive on top of the Wasatch Plateau. Elk are an increasingly important factor in this subunit and thus several studies were established in consideration of the importance of monitoring critical elk habitat.

Winter range availability, condition, and productivity have always been an issue on this important deer herd unit in central Utah. Due to location and access, a large number of hunters use this unit and they continue to contribute an important portion of the yearly statewide deer harvest. The majority of the critical winter range in subunit 16B is found along highway corridors and adjacent to agricultural areas. As a result, two issues facing wildlife managers in this unit are highway mortality and crop depredation. Nearly all of the Division of Wildlife Resources-owned lands in this unit were purchased to try to minimize the effects of these two factors. Habitat management objectives for this unit include working with federal agencies, local governments, and private landowners to achieve long term habitat protection and preservation.

#### Big Game Management Objectives

The current management objective is to maintain a herd of 38,000 wintering deer for management units 16B and 16C. The estimated herd size has grown from 26,000 deer in 2002 to 32,700 in 2005. The buck:doe ratio has averaged 11.3:100 during the three year period from 2003 to 2005, slightly below the objective of 15 to 20 bucks per 100 does (Hersey and McLaughlin 2006). From 1999 to 2005 the fawn:doe ratio has averaged 66:100.

The current elk management objective is to maintain a winter herd population of 12,000. From 2002 to 2005 the estimated population has ranged from 8,800 to 11,100 (Hersey and McLaughlin 2006).

#### Trend Study Description

A total of 14 studies were established in the subunit in 1989 and were reread in either 1997 or 1999, 2002 and 2007. Two studies have been suspended since 1989. In 2007, 12 were sampled.

## SUMMARY

### WILDLIFE MANAGEMENT SUBUNIT 16B - CENTRAL MOUNTAINS, MANTI NORTH

Trend studies in this management unit were established in 1989 and reread in 1997, 2002, and 2007. Two studies, Oak Creek Ridge Aspen (16B-13) and Oak Creek Ridge Seeding (16B-14) have slightly different sampling schedules and were reread in 1999, 2002, and 2007. Two studies, East Dairy Fork (16B-7) and Oak Creek (16B-12) were not sampled in 2002 or 2007.

#### Community Types

The studies in this unit primarily monitor sagebrush, mountain brush, and chained pinyon-juniper communities. Specifically, one study is dominated by aspen (*Populus tremuloides*), four are mountain brush studies, four are mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) studies, two are basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) studies, and one is a high elevation, dry meadow.

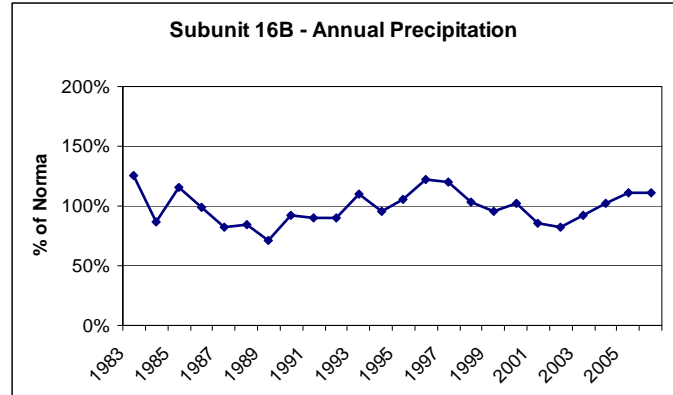
#### Precipitation

Precipitation, both the annual and seasonal plays an important role in vegetation trends. Data from two weather stations within the boundaries of unit 16B, Fairview 8N and Scofield-Skyland Mine, were summarized for precipitation patterns over the past two decades. The combined average annual precipitation during that time from both stations is 20.7 inches (52.6 cm). Drought conditions (less than 75% of annual precipitation) occurred in 1989, and precipitation was below normal in 1984, 1986-1988, 1990-1992, 1994, 1999, and 2001-2003 (Figure 1).

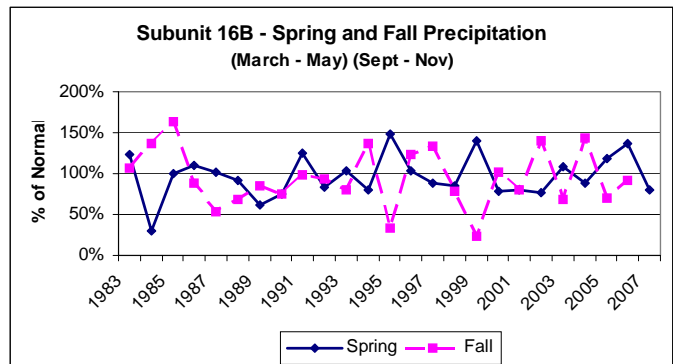
Seasonal distribution of precipitation (spring vs. fall) may have a larger impact on vegetation trends than total annual precipitation. Analysis of the weather station data showed that spring precipitation was below normal for more than half of the period of record including from 2000-2002, and again in 2004 and 2007 (Figure 2). Spring precipitation is essential for cool season perennial species to germinate and be productive. Fall precipitation was also below normal for more than half of the period of record, and was lowest in 1995 and 1999.

#### Browse

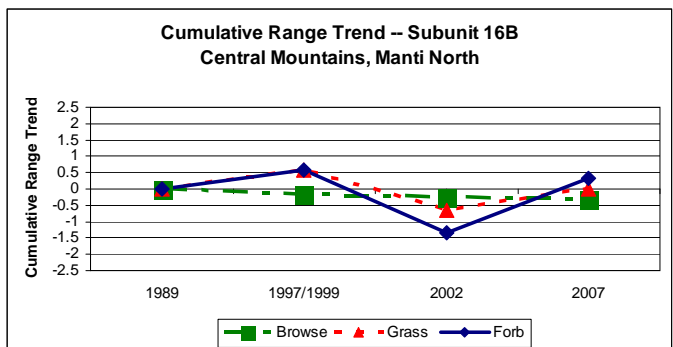
The cumulative browse trend for subunit 16B was nearly stable since 1997 (Figure 3). Browse trend was down at Mill Fork (16B-6). Trend was slightly down at five studies: Long Ridge South (16B-1),



**Figure 1.** Percent of normal annual precipitation averaged for weather stations in subunit 16B (Utah Climate Summaries 2007).



**Figure 2.** Percent of normal seasonal precipitation for weather stations in subunit 16B (Utah Climate Summaries).



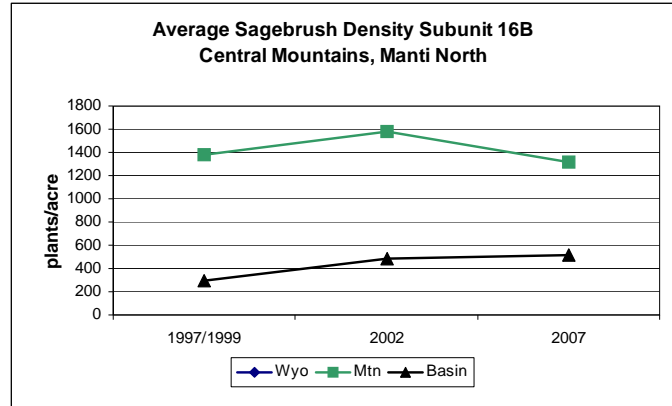
**Figure 3.** Cumulative range trend for the browse, grass, and forb components in subunit 16B.

Long Ridge North (16B-2), Rocky Hollow (16B-3), Starvation Mahogany (16B-8), and Starvation Mountain Browse (16B-9). Browse trend remained stable at four studies: Dry Creek Chaining (16B-4), Jackson Unit (16B-5), Dairy Fork Burn (16B-10), and Oak Creek Ridge Seeding (16B-14). Browse trend was slightly up at Hilltop (16B-11). And lastly, browse trend was up at Oak Creek Ridge Aspen (16B-13). Of the studies with mountain brush communities, browse trend was slightly down for three, and stable for one. Of the studies with mountain big sagebrush communities, browse trend was down for one, slightly down for two, and slightly up for one. Both of the basin big sagebrush studies had a stable browse trend. Browse trend was up at the aspen study, and was stable in the dry meadow study (there continues to be no preferred browse species).

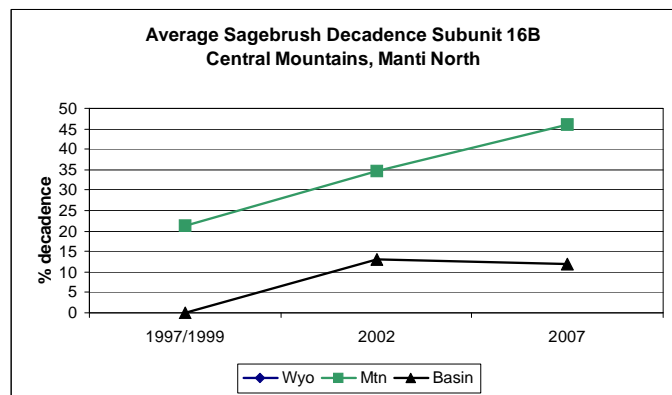
The changes in browse trend were largely influenced by changes in preferred browse density. The subunit average density of mountain big sagebrush decreased by 16% from 2002 to 2007 (Figure 4). Basin big sagebrush occurred at densities great enough to be detected at only one study, Dairy Fork Burn (16B-10) and increased by 8% since 2002.

The subunit average mountain big sagebrush decadence increased from 21% in 1997, to 35% in 2002, and 46% in 2007 (Figure 5). The subunit average was largely influenced by the all-decadent, low-density population at Dry Creek Chaining (16B-4). If that population was not decadent, than the subunit average would have been 22% in 2002 and 33% in 2007. Regardless, there was an increase in average decadence from 2002 to 2007. Some of this increase is attributed to the presence of the sagebrush defoliator moth (*Aroga websteri*), which infested an average of 25% of the plants on four of the mountain big sagebrush studies. Interestingly, the defoliator moth was found at Long Ridge South, but not at Long Ridge North, which lies 70 paces away. The reason may be the difference in aspect of the two studies, and the expected difference in soil moisture. It is possible that the plants on the drier Long Ridge South study are more stressed, and thus more susceptible to infestation. Percent decadence for basin big sagebrush slightly decreased at Dairy Fork Burn, even though defoliator moth damage was observed on 42% of the plants.

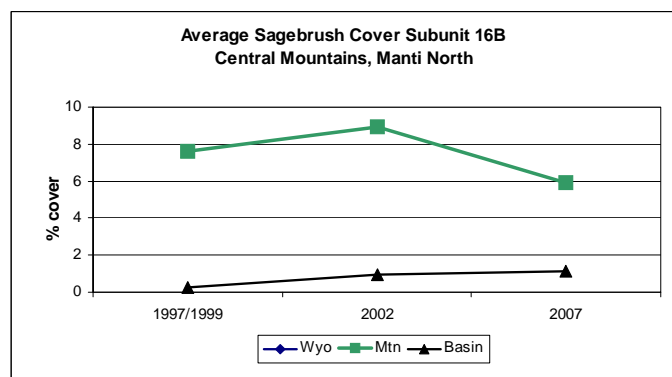
The subunit average percent of ground cover occupied by mountain big sagebrush decreased from 9% to 5% since 2002, and is at the lowest level since sagebrush cover data were collected (Figure 6). The percentage of ground cover occupied by basin big sagebrush is an average of two studies, Dairy Fork Burn and Jackson Unit.



**Figure 4.** Average density of mountain big sagebrush and basin big sagebrush in subunit 16B.



**Figure 5.** Average percent decadence of mountain big sagebrush and basin big sagebrush in subunit 16B.



**Figure 6.** Average percent cover of mountain big sagebrush and basin big sagebrush in subunit 16B.

The cover was much lower at Jackson Unit (near zero for all sample years) than at Dairy Fork Burn.

### Grass

The subunit average grass trend decreased from 1997 to 2002 and was relatively stable to 2007 (Figure 3). The grass trend was down for two studies, Long Ridge South and Oak Creek Ridge Aspen; and was slightly down for two other studies, Dry Creek Chaining and Oak Creek Ridge Seeding. The grass trend was stable at four studies, Jackson Unit, Mill Fork, Starvation Mahogany, and Starvation Mountain Brush. The grass trend was slightly up at Rocky Hollow and Hilltop, and was up at Long Ridge North and Dairy Fork Burn.

The average sum of nested frequency for perennial grasses increased slightly in 2007 (Figure 7). The average ground cover occupied by perennial grass has steadily increased from 10% in 1997 and was 14% in 2007 (Figure 8). Cheatgrass frequency and cover both declined slightly from 1997 to 2002, then increased slightly in 2007, but remained below the 1997 values. Cheatgrass is most abundant at Long Ridge South and Rocky Hollow. Cheatgrass was sampled for the first time in 2007 at Mill Fork and Starvation Mahogany.

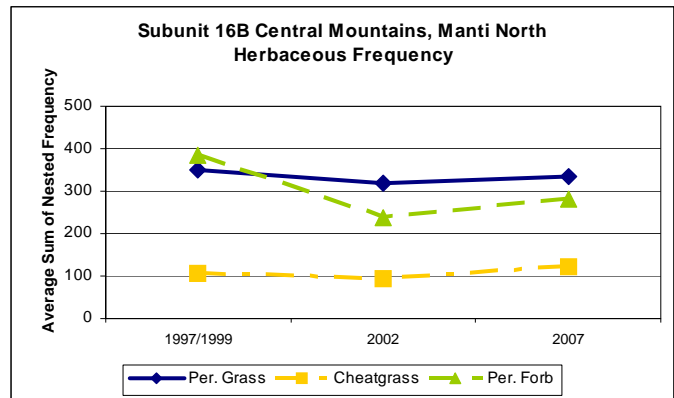
### Forb

The subunit average forb trend increased from 2002 to 2007 and is the only vegetative trend to have an average positive score in 2007 (Figure 3). The forb trend was down at two studies, Rocky Hollow and Hilltop. The forb trend was stable at five studies, Dry Creek Chaining, Jackson Unit, Starvation Mountain Brush, Oak Creek Ridge Aspen, and Oak Creek Ridge Seeding. The forb trend was slightly up at two studies, Long Ridge North, and Starvation Mahogany. And lastly, the forb trend was up at three studies, Long Ridge South, Mill Fork, and Dairy Fork Burn.

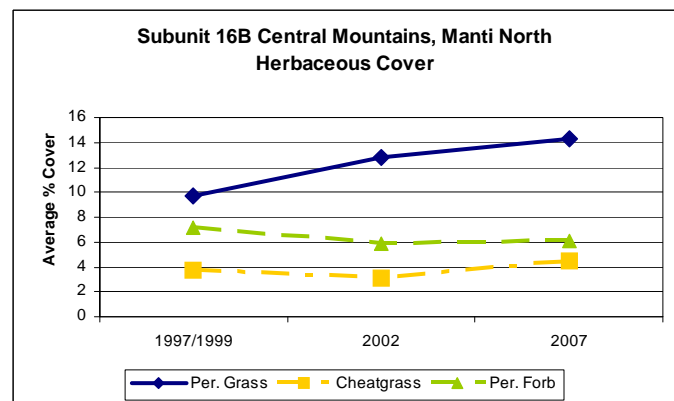
The average sum of nested frequency for perennial forbs decreased by 37% from 1997 to 2002, and increased by 19% between 2002 and 2007 (Figure 7). The subunit average ground cover occupied by perennial forbs has remained nearly constant since 1997 and was 6% in 2007 (Figure 8). The average nested frequency and average ground cover of bur buttercup (*Ranunculus testiculatus*), an allelopathic annual (Buchanan et al. 1978), has steadily increased since 1997. Bur buttercup increase was greatest at Dry Creek Chaining, Mill Fork, and Hilltop, three studies with open understory spaces and with moderate to low competition from other herbaceous species.

### Desirable Components Index

The Desirable Components Index (DCI) was calculated for 10 of the 12 studies in subunit 16B. Two of these studies are in the high potential category and eight are in the mid-level potential category. The remaining two studies are summer range studies and the DCI does not apply to them. The average DCI score improved from fair in 1997 and 2002 to good in 2007 for the two high potential studies, Starvation Mahogany and Starvation Mountain Brush (Figure 9). The improvement was attributed to an increase in perennial grass cover and a decrease in shrub decadency. The DCI score has steadily declined for the mid-level potential studies from

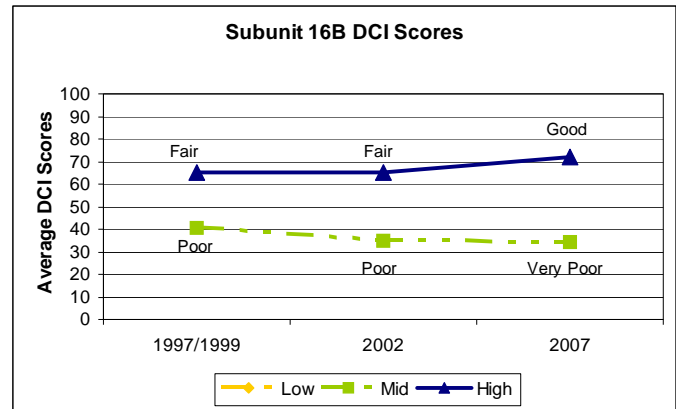


**Figure 7.** Average sum of nested frequency for the herbaceous understory in subunit 16B.



**Figure 8.** Average percent cover for the herbaceous understory in subunit 16B.

poor in 1997 and 2002 to very poor in 2007. The decline is attributed to less shrub cover and increased shrub decadence. Collectively, the DCI scores would be lower were it not for a general increase in perennial grass cover.



**Figure 9.** Average DCI scores for subunit 16B. The scores are divided into categories based on ecological potential and include: high, mid-level, and low.